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USSR Report

CONSTRUCTION AND RELATED INDUSTRIES

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USSR REPORT

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CONSTRUCTION PLANNING AND ECONOMICS

CONSTRUCTION OFFICIALS DISCUSS PRICING

New Belorussian Experiment

Moscow EKONOMICHESKAYA GAZETA in Russian No 49, Dec 82 p 19

[Article by V. Yevtukh, BSSR Gosstroy chairman, under the heading "Construction Economy": "Gain of Four Percent of Estimated Cost in New Experiment By Belorussian Construction Workers"]

[Text] Six years ago, two Belorussian construction ministries were changed over to calculations for projects fully ready to produce output and render services, with expenditures on unfinished production covered by bank loans. The effectiveness of this economic experiment can be judged by these data: during the 10th Five-Year Plan, BSSR Ministry for Industrial Construction organizations succeeded in reducing the time involved in putting up projects by 13-17 percent. The number of projects released to clients was increased by more than a third during the five-year period and "unfinisheds" were appreciably reduced.

Under the new system of calculations with clients, commodity construction output volume, along with putting projects into operation, has moved to the fore among pricing indicators of contractor organization activity. A study of the experience in using this indicator in the practical work of Belorussian construction organizations shows that its role is not limited just to its accelerating start-up. Commodity construction output, that is, essentially, the price at which contractors market construction-installation work done on projects put into operation to clients, can become an effective lever for lowering the resources-intensiveness of capital construction.

Planners and Builders. Under the existing system of estimate price formation, the cost of commodity construction output is determined in a majority of instances only at the end of project working planning. The cost depends basically on planning resolutions and their resultant expenditure of resources, foremost materials and labor, on putting each building and structure up. The fewer expensive materials are required thanks to the use of scientific and technical achievements in the plan, the lower the commodity construction output volume. But such reductions lead to deterioration in a majority of the pricing indicators for builders.

It is more advantageous for contractor organizations to adopt plans with traditional materials-intensive design resolutions and then make them as efficient

as possible in the course of the construction. And in fact, this does not entail change in the estimated cost of the project according to the "Capital Construction Contract Agreement Regulations" currently in effect. But from the position of public interests, it is more appropriate that a plan be initially developed in the economical variant.

It is the planners who must be the primary initiators in introducing the achievements of science, engineering and leading experience. However, they are not economically interested in this today. The use of effective designs and space-layout resolutions increases planning labor-intensiveness and complexity as compared with stereotyped variants and is not compensated for either by increased volumes of planning-surveying work nor by higher levels of material incentives.

These contradictions provide grounds for considering it necessary to create an economic mechanism which would ensure a better combination of the interests of planners and contractors with state tasks.

The basis of such an economic mechanism must, we feel, be the introduction of stable prices for construction end product which will reflect the socially necessary level of expenditures on putting up a unit of capacity (space, volume, length) of projects with consideration of their consumer features. Consideration must be given when developing these prices to the average-progressive technical level of construction in corresponding projects in the base five-year plan.

The savings ensured by using scientific and technical achievements in plans are not excluded from work volumes, commodity construction output or all construction-installation organization activity indicators derived from them. The amount of planning-surveying work is also determined based on the estimated cost of the projects being planned, which is established using stable prices which do not exclude these savings. Thus, the long-standing approach to improving the effectiveness of planning resolutions by workers in construction-installation organizations is disseminated to the planning stage.

Using the Experience of Friends. The appropriateness of the system of price-formation and economic incentives in planning and contractor organizations presented here has been confirmed by the experience of the German Democratic Republic in improving production efficiency, the CPSU Central Committee Accountability Report to the 26th Party Congress having pointed out the necessity of studying it and widely introducing it. The use of consolidated stable prices in recent years has enabled GDR builders to accelerate the actualization of scientific and technical achievements and, on that basis, ensure a substantial savings in resources. Thus, the 1981-1985 five-year plan adopted by the 10th SEPG [Socialist Unity Party of Germany] Congress anticipated providing more than half the planned increment in construction output without increasing material assets over 1980, with a 6-7 percent annual increase in labor productivity.

This experience was carefully studied by a group of specialists which visited the GDR and then made appropriate proposals to the government of our republic. The BSSR Council of Ministers discussed this question and recognized the expediency of conducting an experiment anticipating a reduction in the expenditure of production resources in construction through the use of scientific and technical achievements in plans and the use of stable commodity construction output prices.

Of course, the specific conditions for capital construction in the GDR and those in our country definitely differ. Much work therefore had to be done to create methods for conducting the experiment which would take into account both domestic construction experience and the experience of our friends from the GDR.

The Belorussian Gosstroy and Belorussian branch of the USSR Gosstroy All-Union Scientific Research and Planning Institute of Construction Labor, with the participation of concerned republic ministries and departments, as well as planning institutes, have prepared draft "methods provisions" regulating procedures for conducting the experiment. After needed refinements, this document was approved in June of this year by an interdepartmental commission attached to the USSR Gosplan.

Equivalent of Stable Prices. When developing the methods provisions for the experiment, consideration was given to the fact that, in connection with the forthcoming changeover of capital construction to new, unified estimates, the practical use of stable commodity construction output prices would not be possible before 1984-1985. In order to avoid putting off verification of the effectiveness of the economic levers of the experiment and its methods that long, we defined a type of project for which the sources of estimate price formation would be hypothetically equivalent to stable prices. Projects of any type whose estimated commodity construction output cost would be set not only on the basis of stable prices, but also on the basis of current price lists or estimates for standard or reused economical individual plans, and which were situated within the Belorussian SSR could therefore be enlisted in the experiment.

The experiment covers buildings and structures whose construction begins in 1982 and thereafter if the estimate-planning documentation for them has been accepted by the general contractor prior to 1 July 1981. We also anticipate the use of a stable-price equivalent, called calculation price for this particular experiment. These prices will be set for individual projects being put up using individual plans using resolutions substantially exceeding the current technical level. Calculation prices will include the cost of construction-installation work based on estimates reflecting progressive planning resolutions and the savings from using the latest scientific and technical achievements in the plan.

It has been established that 25 percent of the savings from the use of scientific and technical achievements in the plan will be contributed to the state budget by the contractor organization. A similar share of this savings will be granted to the contractor construction-installation organization to recompense the higher production outlays connected with introducing the achievements of science, engineering and leading experience (as, for example, expenditures on training workers in new technological processes, equipping work areas). When necessary, work on reworking standard and other plans for the purpose of using more economical resolutions on the basis of direct agreements among contractor and planning organizations may also be paid for. The remaining 50 percent is to be directed into awarding bonuses to experiment participants, including 30 percent to construction workers, 17.5 percent to planners and 2.5 percent to clients.

After careful examination of the opportunities for meeting additional planning work limits, we have currently included in the experiment a list of 142 projects

with a total commodity construction output volume of about 170 million rubles. Preliminary calculations show that the resources savings from the planned improvement in planning resolution effectiveness will reach approximately four percent of the initial estimated cost of the construction-installation work, in cost terms.

The greatest savings will be seen in the cooling tower for the Mozyrskiy Fodder Yeast Plant. It was decided to use a fundamentally new frame and sprinkler unit suspension design resolution in the plan. This enabled us to lower the cost of the construction-installation work by 21 percent.

The Minsk division of the "PromtransNIIproyekt" [State Planning and Scientific Research Institute for the Development of Transport Industry Structure and Installation Plans] plans to achieve a savings totalling 150,000 rubles (14.9 percent of the commodity construction output cost) in the plan for an overpass in Gomel'.

The fact that almost all the main planning organizations and many contractor organizations of the republic have offered to participate in the experiment right at its start testifies to the high creative activeness of the collectives, which will doubtless facilitate carrying out the important tasks of increasing the effectiveness of capital construction in the republic.

Interkolkhoz Cost-Accounting Problems

Moscow EKONOMICHESKAYA GAZETA in Russian No 44, Oct 82 p 8

[Article by V. Gramm, chief engineer of the RSFSR Gosstroy's Glavgosekspertiz (not further identified) under the heading "Economic Mechanism and Economical Work": "Barriers to Strengthening Cost Accounting"]

[Text] It is simply impossible to resolve the tasks set by the Food Program without strengthening cost accounting in interkolkhoz construction organizations and setting up price formation properly. Unfortunately, things have thus far not gone well in substantiating prices in interfarm construction organizations.

Interkolkhoz construction organizations (ICO) now use estimated costs, established for the state construction organizations of the ministries of rural construction of union republics, to determine the cost of construction production. Practice has shown that the use of these prices in the ICO does not reflect actual production expenditures. Why?

As is known, estimate prices consist of zone prices for construction materials, items and components and the unified zone regional unit estimates for construction work linked to them (UZRUE). In this regard, the zone prices take into account the wholesale prices in industry which are in effect when estimated construction prices go into effect.

Over the years since 1969, wholesale prices have nearly all changed. The problem was solved in a well thought-out, unambiguous manner for state construction organizations: all wholesale price changes are no longer taken into account in estimates, but are reflected in financial plans through increases or decreases in the profit plan and corresponding deductions from it into the state budget.

Another matter are the ICO's, which, having no direct ties to the state budget, are obligated to consider all current changes in price-formation factors in the estimated cost, that is, they must in practice determine the cost of their own construction output in prices of the year in which the construction is done. Under these conditions, the use of regional (zone) unit estimates in effect which have been developed on the basis of the conditions of state construction organization activity leads to significant discrepancies between estimated construction cost and expenditures. As a consequence, a majority of the ICO's have profits or losses not dependent on them.

In our view, the reasons for this situation are of particular interest and are worth discussing.

On the recommendation of the Roskolkhozstroyob"yedineniye [Russian Kolkhoz Construction Association], the interkolkhoz construction associations of the Russian Federation began using constant estimate prices and overheads established for state construction organizations as of 1 January 1969.

From the very start, this decision conflicted with USSR Gosstroy instruction No I 113-56, under which one should proceed from construction materials wholesale prices in effect in the year the construction is done when drawing up estimate documentation for construction projects on kolkhozes and in calculations for construction-installation work done for them. Therefore, within a year, when wholesale prices for certain construction materials were reviewed, the practice of using constant estimate prices came into conflict with reality.

In its search for at least a partial way out of this situation, the Roskolkhozstroyob"yedineniye, with the concurrence of the RSFSR Ministry of Agriculture, instituted instructions anticipating the use of zone estimate price adjustments for construction done by ICO's.

However, the Russian Republic Gosbank Office unexpectedly opposed these adjustments, declaring that they conflict with USSR Gosstroy instructions on using UZRUE-69 and lead to an unjustified increase in the cost of construction. Thus, without thoroughly investigating the difference between the economic features of state enterprises and kolkhoz-cooperative organizations, the office decided that USSR Gosstroy instructions pertaining to the extension of zone estimate prices of the USSR Ministry for Rural Construction to construction sites of other ministries and departments in rural areas applied to the ICO's as well.

The bank office has held its position very firmly. Its certainty could not even be shaken by a special USSR Gosstroy clarification stating that, inasmuch as interkolkhoz construction organizations operate on cooperative principles and a cost-accounting, fully self-supporting basis, the procedure established for state contractor construction organizations did not extend to them.

Unfortunately, the Roskolkhozstroyob"yedineniye has lost interest since that time in the question of putting estimate prices for construction done by the ICO's on kolkhozes into proper order. A sad ending to this story, and one with which we naturally cannot be satisfied.

An immediate decision is required on questions of setting right estimate price formation for construction done by ICO's. We need to develop and issue an instruction on procedures for determining the estimated cost of construction, including overheads, in this instance. The proper agency for this job would seem to be the USSR Ministry of Agriculture, with the involvement of republic interkolkhoz construction organization associations. But we need first of all to ensure the immediate development for each cost-accounting ICO of transport plans, transport expenditure calculations and estimate price calculations for local construction materials, items and components and the linking of unit estimates, without which we will be unable to recalculate estimate documentation to 1984 prices at the proper time.

11052
CSO: 1821/39

AGRICULTURAL CONSTRUCTION

PROBLEMS FACING RURAL CONSTRUCTION DEBATED

Rural Housing Construction

Tallinn SOVETSKAYA ESTONIYA in Russian 13 Jan 83 p 3

[Article by Candidate of Economic Sciences, Docent A. Astashkin, Department of Land Development, Estonian Agricultural Academy: "Where to Build, What to Build and How to Build?"]

> [Text] Last year the newspaper began a serious conversation on the problems of rural construction--one of the key problems in solving the Food Program. The editorial mail indicates that these materials evoked interest among readers, who raise ever newer aspects of the problems touched on. Therefore, it was decided to continue the initiated topic during the new year and to determine in a joint search the most efficient and realistic methods of accelerating social development of the countryside. Today a word to the scientist.

Lively discussions proceeded for many years on the problem of what a rural house should look like. Practice mainly answered this question: most rural residents prefer single-family homes of the farmhouse type and two-story homes with apartments on two levels with sections and economic buildings near the farmsteads. A questionnaire survey that we conducted on 10 farms of the republic showed that 88 percent of those questioned spoke in favor of these types of homes.

The historically established single-story farmhouse is best adapted to carry out private subsidiary farming and corresponds to the greatest degree to the traditional living conditions of the rural population. Therefore, a course has recently been taken toward primary construction of this type of housing in the countryside. Whereas in 1981, farmhouses comprised approximately 22 percent of the total housing fund in state rural construction, it is planned by 1985 to increase this fraction to 33.6 percent. At the same time, construction of multistory sectional homes will be reduced one-half.

However, we feel that extremes are intolerable in this important question. As P. Pyder correctly wrote in SOVETSKAYA ESTONIYA of 15 October 1982, "Every peasant of a large farmstead should not be permitted to reach a utopia in construction."

An increase in construction of farmhouse-type homes in the countryside contradicts economic requirements. It is known that the cost of a single square meter of housing area in single-family homes is 1.5 or more times more expensive than in multistory apartment buildings. Moreover, farmhouse construction will increase the area of villages and at the same time will increase expenditures for construction of supply lines and for development of the village as a whole. Therefore, the planners and builders are faced with the need to work out new planning solutions and to seek out methods that compensate to a significant degree for the negative consequences related to an increase of expenditures for construction and development of villages and to a reduction of the density of construction.

Groups of the population, different in social, occupational and demographic composition, live in rural villages and their needs are different. Therefore, homes of different types and with different number of stories should subsequently be constructed in the countryside.

The fraction of single-family farmhouses, we feel, can be increased to a maximum of 50-60 percent with regard to these circumstances.

The course taken by the party toward fuller use of the resources of private subsidiary farming requires improvement of the types of homes and construction of villages. For example, the questionnaire surveys that we conducted indicate that the residents of sectional homes and homes of increased number of stories have less developed subsidiary farming than residents of single-family farmhouses.

The multifaceted vital activity of rural residents, incidentally like that of urban residents, is not limited to their home. It is very important how this home is located with respect to kindergartens, schools, hospitals, clubs, public service enterprises, transportation, large cities and administrative centers for education and teaching of children and to meet cultural and everyday needs.

The khutor and small village system of settlement established in the past makes the solution of socioeconomic problems more and more difficult under modern conditions. According to data of our surveys, there are approximately 4,300 settlements and villages and 64,300 khutors on the kolkhozes and sovkhozes of the republic. Only 234 settlements have been included in the future solution of the government of the republic, adopted in 1978. Five years have passed. The experience accumulated during this time requires the introduction of specific correctives. Only one-fourth of the rural population now live in the future settlements. Naturally a complex and contradictory complex of problems of small villages and khutors and service to them arises. The idea of concentrating the rural population in large well-developed villages, correct in itself, is not always put into practice in improvement of rural settlement in a well-thought-out manner. For example, allocation of a considerable part of existing settlements to the "unpromising" category and elimination of part of the children's preschool institutions and schools significantly affected departure of the work force from these settlements and thus inflicted a great loss to development of agriculture.

When determining future forms of rural settlement, frequently urban principles of construction are mechanically employed. For example, the size of the settlement was sometimes justified by the feasibility of operating cultural and service facilities.

It is impossible to approach rural settlements with the same yardsticks as to the city. The productive function of any rural settlement is related to servicing a specific land territory. Therefore, the location of settlements and their size must be considered in the relationship to the farms, fields, meadows, roads and production organization of the entire territory. Our investigations show that, based on purely economic calculations, the least annual expenditures per capita go to servicing a settlement of 3,000-4,000 hectares of agricultural lands. Consequently, a rational future form of settlement is a single village per farm. But one cannot proceed in practical solution of this problem only from "pure economy." The conditions of land use and the established settlement must also be taken into account. The development of transport and many other specific conditions, which may have a significant influence on the quality of settlements on a farm must be taken into account. In any case, the problem of the size of populated points and their optimization remains very debatable.

Realization of the future system of settlement requires a gradual step by step approach. The policy in the area of settlement with regard to economic conclusions, data of sociological investigations and tasks of the Food Program should be based on the following principles: gradual concentration of new construction in future settlements that guarantee the necessary level of cultural services to residents of the remaining settlements, development of convenient and dependable transportation between small settlements and future settlements and nearby towns, railway stations and other administrative and cultural centers, retained during the transition period.

A clear program of action should be worked out with respect to khutors. Part of them, which does not interfere with organization of agricultural production, can be retained and used for different purposes. Some khutors may be left as cultural monuments and memorials to the history of architecture. It is especially important to resolve the fate of thousands of empty khutors. They could be used as second "homes" for city residents. Convenient to roads and near settlements, they could continue to exist as recreation areas. All khutors should be inventoried for these purposes and their socioeconomic significance should be determined.

The difficult question of locating sociocultural and communal service facilities arises with the existing small-settlement arrangement. If they are located only in future settlements, the problem of servicing the remaining ones is not resolved. The service radius comprises an average of 13-15 kilometers in this case. It is not feasible to build complexes of service facilities in other settlements and it is impossible with limited available resources. How can this contradiction be resolved?

We feel that the list of future settlements must first be increased. One may not recognize as correct that there are now future settlements on all farms of

the republic. One-fourth of the kolkhozes and sovkhozes does not have them. Relating even part of the existing settlements (327) to the "limited development" category does not strengthen the work force in them. Many of these settlements have the prerequisites for development and can be included in future settlements.

Future settlements and cities, like the supporting framework of group systems of settlement, should take on functions of social and service facilities to the residents of small settlements and khutors, retention of which at the given stage is caused by economic necessity.

We are talking not only about the use of the existing housing fund, although this cannot be omitted from calculations. Consolidation of the work force--the most important factor of production--in the countryside is of more important significance. An outflow of the work force inevitably results in lands falling out of agricultural use and in other negative and frequently irreversible consequences. Therefore, it is no accident that solution of the social problems of the countryside is considered as an organic part of the Food Program. One cannot be guided only by economic concepts in problems of restructuring of the countryside.

Investigations show that significant economic and social differences remain between farms located near rayon centers and those remote from them. These differences are manifested both in the results of production and in the level of support with a work force, qualified personnel and in the age structure of residents. For example, differences between farms on the size of profits (net income) are a multiple of four, those in support with a work force are a multiple of two and those in the presence of non-production funds per worker are a multiple of three.

To equalize (to a specific level) the differences in conditions of farming and cultural services to the population, greater attention must be devoted to housing and cultural service construction and to development of communications, transport and other elements of the social and production infrastructure on economically weak farms, where the shortage of the work force is felt especially acutely. These farms are unable to create a developed infrastructure through their own funds. They require material support both by the government and by deductions to special specific funds (at the rayon and republic level) Favorable opportunities have now been created for lagging sections to catch up within rayon agroindustrial associations.

Construction in Non-Chernozem Zone

Moscow STROITEL'NAYA GAZETA in Russian 28 Jan 83 p 2

[Article: "We Cannot Remain Silent in Construction of New Sovkhozes of the Non-Chernozem Zone"]

[Text] The non-chernozem zone of the Russian Federation is the largest industrial and agricultural region of the country. Construction of 52 new sovkhozes in the region with high concentration of agricultural production and

construction of modern reclamation systems will make it possible to improve the use of arable land, to achieve maximum productivity and to produce a guaranteed yield from each hectare. This will contribute to a significant degree to fulfillment of the Food Program, approved by the May (1982) Plenum of the CPSU Central Committee.

With what results did the contract organizations at these facilities finish last year?

The collectives of USSR Minpromstroy [Ministry of Industrial Construction] and USSR Minstroy [Ministry of Construction] fulfilled the production tasks from month to month. Rhythmic operation permitted them to finish the year successfully as a whole. According to preliminary data, the planned tasks of construction and installation work were fulfilled by these ministries by 102 and 101 percent, respectively.

The work experience of the contractor, customer and of oblast organizations in Ryazan Oblast in construction of the Moskovskiy sovkoz should especially be noted. The collectives of the sovkhoz, the Ryazan'melioratsiya Associations [not further identified] of Glavnechernozemvodstroy [Main Administration for Reclamation in the Non-Chernozem Zone] and Ryazan'stroy [not further identified] of the USSR Minpromstroy and oblast organizations have worked out specific measures to guarantee introduction and assimilation of production capacities ahead of schedule (by almost 2 years).

The results of work last year (the plan in sovkhoz construction was overfulfilled almost threefold) indicate the pledges of the collectives will be fulfilled. Thus, the initiative, also supported by the necessary funds on the part of the customer--Glavnechernozemvodstroy, and by the specific assistance of patrons--enterprises of the Ryazan railroad region, and of the Komsomol obkom produced discernible results. It is obvious that the experience of the Ryazan workers should be studied carefully and should be applied to other sovkhoz construction projects.

Patrons from other oblasts and cities of the Russian Federation and representatives of fraternal republics are also rendering great assistance in construction of sovkhozes of the non-chernozem zone.

By the end of the five-year plan, patrons from Uzbekistan, for example, have pledged to complete construction and installation work worth 178 million rubles, which comprises 44 percent of the total volume of patronage organizations. One can now say confidently that patrons knew how to prepare good groundwork for successful fulfillment of their pledges. Thus, the Uzbek SSR Minvodkhoz [Ministry of Land Reclamation and Water Resources] fulfilled the plan of construction and installation work for sovkhoz construction facilities by 105 percent, while Goskomvodstroy [State Committee for Water Resources Construction] of the republic fulfilled the plan by 101 percent.

The plan for construction of production facilities by patrons from Tadzhikistan has been fulfilled. Thousands of hectares of reclaimed lands have been turned over for operation, which will make a significant addition even this year in production of agricultural products.

It is especially gladdening that the plans for introduction of housing have been fulfilled parallel with production construction on many sovkhozes, specifically, Tashkentskiy in Novgorod Oblast, X pyatiletka in Kalinin Oblast, Shatovskiy in Gorkiy Oblast and Druzhba in Ivanova Oblast. At the same time, it should be noted that fulfillment of the task to introduce housing area has been generally interrupted in the sovkhozes as a whole. Rural workers have had a shortfall of almost 15,000 square meters of housing. The contract organizations should devote maximum attention from the first days of the current year to these most important facilities so as not only to cope with the annual plans but also to make up the committed lag.

A number of critical comments were addressed in the economic survey "Deadline and Tempos" (STROITEL'NAYA GAZETA No 127, 24 October 1982) to the contract organizations of RSFSR Minsel'stroy [Ministry of Rural Construction] and Roskolkhozstroyob"yedineniya [not further identified]. As a member of the board of the ministry, L. Zapal'skiy reported to the editors, the course of construction was considered at RSFSR Minsel'stroy and supplementary measures were adopted to improve the work. However, as the yearly results showed, these measures were clearly inadequate. Only 10 of 15 million rubles' worth of construction and installation work was completed throughout the ministry. Moreover the rates of work were even reduced: whereas rural builders assimilated 2.7 million rubles during the third quarter, they assimilated 2.5 million rubles during the fourth quarter.

Specific sovkhozes were mentioned in the survey: Porech'ye, SEmibratovo and Vasil'kovskiy in Yaroslavl Oblast and Shuyskiy in Ivanova Oblast. Perhaps there is an improvement on these sovkhozes? There was none whatsoever. The construction and installation work on these farms were fulfilled by 58, 67 and 56 percent, respectively, while work was not even begun on Shuyskiy sovkhoz, as noted earlier.

A check revealed that last year's debt of RSFSR Minsel'stroy to rural workers of five million rubles was increased by the same amount, but the official response of Comrade Zapal'skiy was the usual answer written for form only.

A similar situation was also established in many contract organizations of Roskolkhozstroyob"yedineniya. The kolkhoz builders also did not cope with the plan: only 6.75 of 9.1 million rubles of construction and installation were assimilated. To cope with the situation, as becomes clear from the letter to the editor of the Chairman of the Administration of Roskolkhozstroyob"yedineniya V. Vid'manov, it is planned to concentrate the necessary number of human and material resources on the lagging facilities and supplementary tasks have been established to complete the construction and installation work at facilities of Glavnechernozemvodstroy so as to make up the lag this year. A decision has been adopted to allocate supplementary farmhouse-type housing for the Sozh sovkhoz and the Sovkhoz imeni Yegorov in Smolensk Oblast.

Construction of networks and supply systems outside the sites is lagging as before. This has become a typical feature of those facilities where the contractors are not coping with the plan. Striving at least to correct the situation somehow, they are attempting primarily to complete "advantageous" jobs, postponing all others to the future. What will this result in?

For example, several 18-apartment buildings are almost ready on the Semibratovo and Vasil'kovskiy sovkhozes, but they cannot begin to be finished due to the lack of heat and supply lines, while the Rostovsel'stroy Trust has not yet begun construction of purification plants. The same situation exists at the Sozh Sovkhoz.

According to the decisions of the joint board of USSR Minsel'khoz and Gosgrazhdanstroy [not further identified], farmhouse construction should predominate--50-70 percent--on the sovkhozes in most oblasts and autonomous republics. However, there are still a number of farms where the percentage of this construction is low. And Glavnechernozemvodstroy has something to think about here.

Construction of a number of facilities is being delayed due to untimely support with production and sanitation engineering equipment, cable products, monitoring and measuring instruments and means of automation by Glavnechernozemvodstroy. Thus, it was planned to turn over a powerful boiler plant this year on the Krasava Sovkhoz in Perm Oblast. However, the customer has not yet resolved problems of supporting the construction project with production equipment.

And, finally, the social aspect of creating new farms should be emphasized. The volume of low-qualified labor still remains significant in the countryside. Creation of new sovkhozes with modern structures and irrigation systems, with automated pumping stations, and equipped with electronic monitoring and measuring equipment requires the necessary occupational training of maintenance personnel. This was also indicated in the previous survey. Examples were cited when facilities could not be turned over for operation due to a lack of qualified specialists.

In answering the editorial board, the RSFSR Deputy Minister of Agriculture O. Poteryakhin unfortunately answered this question with silence. But it must now be solved since the farms for which new sovkhozes are being erected will have to operate them.

6521
CSO: 1821/59

HOUSING CONSTRUCTION OFFICIAL OUTLINES PLANS

Moscow STROITEL'NAYA GAZETA in Russian 28 Jan 83 p 3

[Article by E. Sarnatskiy, deputy chairman of the State Committee for Civil Construction and Architecture [Gosgrazhdanstroy]: "'Five-story Ones' Will Be More Comfortable. How to Preserve and Modernize the Country's Available Housing"]

[Text] The country's available housing exceeds the annual volume of new construction by approximately 35 times and totals 3.5 billion m^3. Expenditures for its upkeep and repairs will reach a tremendous sum this year--approximately R6 billion. Moreover, a natural tendency must be borne in mind: expenditures for repairs and service of the constantly replenished housing will grow each year.

The importance of quality capital repairs conducted expeditiously can be hardly exaggerated. They make it possible not only to extend the service period of structures, but also to raise the level of public services and amenities and to make living conditions more comfortable. The planning of rooms is changed when necessary, which creates additional conveniences for residents of a house.

The volume of work involved in capital repairs to available housing is growing annually. For example, more than 70 million m^3 of housing was repaired last year at a cost of R2.5 billion. The periodicity of repairs is determined by the "Provision on Planned Preventive Repairs to Residential and Public Buildings," which was confirmed by USSR Gosstroy. For example, during the next five-year plan it is planned to make capital repairs to many five-story houses, which were constructed according to standard plans of the first mass series.

The repairs of such houses is not a simple matter. It will require certain reorganization of the entire repair and construction process, solution of some organizational and scientific and technical questions and utilization of considerable material and technical resources.

To clarify the substance of this problem, I would like to make a brief historical digression. The mass construction of fully assemblable houses, which was basically begun in 1958, made it possible in its time to rapidly reduce a housing shortage and to move people from basements and communal appartments into well-planned residential housing. However, the "five-story ones" had very substantial design

and room planning shortcomings. Today, they do not meet the increased housing standard requirements. Their heat engineering and soundproof qualities and the size of their corridors and kitchens do not correspond to contemporary norms. Combined bathroom and toilet units units are cause of especially much criticism. Leakages and freezing of the joints occur.

At the same time, an analysis of the technical condition of houses of the obsolete series has made it possible to make a conclusion on sufficient durability of the basic construction elements, which determine the service period of buildings. What should be done with these houses? Would it be expedient to modernize them during the process of capital repairs?

The research conducted by the institutes of the State Committee for Civil Construction and Architecture, the Ministry of Housing and Municipal Services [Minzhilkomkhoz] of the Belorussian SSR and the Scientific Research Institute for the Planning of Major Housing Repairs in the City of Moscow [Moszhilniiproyekt] has shown that the basic expenditures for upkeep of these buildings are connected with elimination of wear of engineering equipment, structural elements and exterior and interior finishing. Moreover, these expenditures will increase sharply in the future owing to the increased wear of the buildings.

At the same time, the estimated cost of work involved in replanning apartments will amount to an average of 20-30 percent of total expenditures for capital repairs. I believe that it is worth to make such additional expenditures in order to raise the comfort of living in such obsolete houses. It appears that capital repairs of the "five-story ones" with partial or complete replanning will become common.

Along with modernization, residential houses of some series will possibly also require reconstruction--basic reconstruction of load-carrying structures and engineering equipment and changes in the buildings' construction volume.

The State Committee for Civil Construction and Architecture is currently studying this problem in detail. Union and republic institutes have been enlisted in solving it. Preliminary estimates of the socioeconomic effectiveness of capital repairs, modernization and reconstruction of residential houses, which were constructed according to standard plans of the first mass series, were approved by a decision of the committee's scientific and technical council presidium. Work to coordinate scientific research is being conducted regularly. Study of this problem is headed by the Central Scientific Research Institute of Experimental Planning [TsNIIEP] of Housing. Together with institutes of the Central Scientific Research Institute of Experimental Planning of Engineering Equipment, the Scientific Research Institute for the Planning of Major Housing Repairs in the City of Moscow and others, it is developing recommendations on modernizing five-story houses of the mass series.

Preparation of architectural, planning and design solutions in conducting capital repairs and modernization of residential houses of such widespread series in the country as I-464, I-335, I-447 and I-468 is also envisaged. Experiments in performing capital repairs and modernization of houses of the I-335 series are already planned for Belorussia during the current five-year plan.

The next stage--working out plans for capital repairs, modernization and reconstruction of all first generation residential houses constructed in our country. All zonal institutes of the State Committee for Civil Construction and Architecture and gosstroys and ministries of housing and municipal services of union republics must participate in this. When possible, the authors--the developers of standard plans of houses--should be enlisted in this work. This will ensure better mutual understanding between operational workers and planners and thus make the search for optimum solutions easier. Such joint creative work will in turn make it possible to consider operational indicators more completely when creating new projects.

Ministries of housing and municipal services with participation of gosstroys of union republics are to ensure fulfillment of scientific research during which all available housing in every republic is to be inspected and the volume and nature of the upcoming repair work and the necessary material and technical expenditures are to be determined. Moreover, scientific research and planning work on modernizing and reconstructing residential houses, which were constructed in a republic according to local first generation standard plans, should also be conducted. Appropriate architectural, planning and technical solutions must also be found.

Correct organization of the repair process itself is of no lesser importance. To make repairs more effective, they should be conducted according to industrial methods. The creation of standard repair plans which will meet this requirement will serve as a basis for subsequent development of catalogs of standardized industrial structures and engineering units. A genuine repair industry will be created.

The complex of measures aimed at ensuring soundness of the constructed housing will make it possible not only to extend the life of every house but also to prevent the great number of available housing in the country--our invaluable wealth--becoming obsolete.

9817
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BUILDING MATERIALS

GREATER USE OF LIGHTWEIGHT MATERIALS ADVOCATED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 12, Dec 82 pp 93-99

[Article by V. Tolpygin under the heading "Economic Practice: A Specialist's Opinion": "Reducing the Weight of Buildings and Saving Materials in Construction"]

[Text] Capital investment planning practice has been criticized sharply for many years. The faults cited have included the scattering of funds among construction sites and projects, the increasing amounts of unfinished construction and the failure to put all production capacities into operation as scheduled. In connection with the failure of contractor construction ministries to carry out plan assignments and the increased estimate cost of construction, the amounts of unfinished construction have risen faster than the amounts of capital investment. During the 1965-1982 period, the one outstripped the other by more than 35 percent, resulting a unfinished construction in a majority of the branches exceeding the normative amounts by 35-45 percent. As of 1 January 1982, they had reached 105.9 billion rubles, or 86 percent of the annual capital investment volume.

At first glance, resolution of the task of reducing the amounts of unfinished construction seems simple: reduce the number of new construction projects or, as some recommend, not begin a single new construction project or even mothball all construction projects less than 25-percent complete, concentrating capital investments on fewer construction sites, and in time, the situation will correct itself. However, implementing measures to reduce the number of construction sites is complicated by a number of objective circumstances. Thus, we begin building projects at existing enterprises of the extractive branches of industry each year to maintain the level of minerals extraction. Galleries and fields are worked out at open-pit and other mines, as are oil and gas fields, and all this must be promptly compensated for in order to prevent a drop in production.

The necessity of renovating or retooling enterprises is increasing. In connection with technical progress, we anticipate the creation of new subbranches and types of production, the outstripping development of a number of existing branches, and this will unavoidably be connected with the creation of new capacities and, consequently, with new construction sites.

We have successed in increasing capital investment concentration somewhat in recent years. The 1980 plan included nearly two-times fewer major construction

projects than the 1979 plan, and their total estimated cost was 40 percent lower. In 1982, the number of new construction projects is slightly lower than last year. However, due to underfulfillment of the plan for putting fixed assets and production capacities into operation in 1981, fewer construction projects were completed than were begun, resulting in an increase in the overall number.

Steps are being taken to further reduce the number of construction sites this five-year plan in order to concentrate resources on start-up projects. In this connection, with the concurrence of local agencies, some small construction projects will be temporarily mothballed. Additional nonproductive expenditures will arise for this mothballing. However, it will hardly be possible to postpone projects in ferrous metallurgy, fuel branches of industry, or the agroindustrial complex, in view of the growing demand for the output of these branches.

The above-plan increase in the amounts of unfinished construction is associated in considerable measure with increasing estimated costs. In the 10th Five-Year Plan, the estimated cost of construction done rose by approximately 60 billion rubles. In 1982, it had increased by 14.4 billion rubles over 1981. Inasmuch as plans generally anticipate putting projects into operation within a year, construction organizations do not always cope with such work not anticipated in the plan and the start-ups are carried over to subsequent years.

The inclusion of large numbers of construction projects in the plan is to be explained in considerable measure by the fact that 72 percent of the production sites are small, sublimit projects. But they account for only four percent of the estimated cost of construction sites included in the plan; 96 percent are construction sites with estimated costs of three million rubles and up. And the bulk of the unfinished production-sphere construction is concentrated at them. A majority of the small construction projects are completed within a year, and unfinished construction for them equals zero. A normative construction duration of 5-6 years is established for the large construction projects, but it actually reaches 10 years for individual projects.

Unfinished construction equalling several annual investment volumes is accumulated at such construction projects. According to our calculations, unfinished construction at projects with a construction duration of four years, given the even start-up of capacities, averages 1.5 annual capital investment volumes; at those with six-year schedules -- 2.5 years; eight years -- 3.5 years, and 10 years -- 4.5 years. This is why it is so important to reduce construction duration for large construction projects: it leads to a relative and absolute decrease in unfinished construction.

Concentrating capital investment at the most important construction sites and limiting the number of projects being built at one time are only individual elements in a broad program of measures to improve capital construction. It encompasses not only capital investment planning (including distribution by construction site), but also construction planning and construction production itself.

Experience in building the KamAZ [Kama Motor Vehicles Plant] and Krasnoyarsk Heavy-Duty Excavators, Compressor and Pump Stations Plant of the Ministry for Construction of Petroleum and Gas Industry Engerprises (Minneftegazstroy) shows

that at an overwhelming majority of the facilities whose installation was completed on schedule or ahead of schedule, the decisive role belonged to progressive components, materials and leading construction technology such as conveyor-unit prefabrication of steel construction components with lightweight roofs and complete-set prefabrication of buildings and equipment. The introduction of high-speed technology became possible foremost because these construction sites succeeded in resolving one of the major tasks of scientific-technical progress in construction -- reducing building and structure weight.

In order to understand more clearly the economic importance of this, let's compare one structural element, traditional and lightweight slab roofing. The former is manufactured from reinforced concrete and insulated with claydite-concrete. Its weight reaches 300 kg/m^2. For lightweight slab roofing made of shaped steel deck with a lightweight insulation, the weight is only 40 kg/m^2. Recalculated to one span of a single-story industrial building, the difference in weight is 74 tons, equivalent to a four-axle rail carload. This means, hypothetically speaking, the roof of each industrial building is covered with an additional whole railroad consist of load. The support components of the building must be of a strength to hold up that load.

In a year, the country's construction sites lay 80 million square meters of these roofs on single-story industrial buildings alone. Consequently, given an average roof width of 24 meters, we are building each year a unique bridge more than 3,300 km long, nearly the length of the Baykal-Amur Mainline.

Heretofore, the reference has been just to roofing slabs. Now let us evaluate the wall panels currently in use. They are considered lightweight because they are made of claydite-concrete. But the technology for manufacturing them is imperfect, so the weight by volume of claydite-concrete is no less than that of brickwork. At a thickness of 35 cm, a square meter of such panels weighs up to 600 kg. But if we were to use three-layer panels made of thin long slabs with a lightweight insulation, the weight per square meter would not exceed 20 kg, that is, 30 times less. And the expenditure of materials on both the panels and the load-bearing elements of buildings would be many-fold less.

However, a significant portion of construction industry enterprises of the primary general contractor ministries -- USSR Ministry of Construction of Heavy Industry Enterprises, USSR Ministry of Industrial Construction and USSR Ministry of Construction -- are oriented towards producing single-layer claydite-concrete panels, not multilayer lightweight ones.

The weight of load-bearing and enclosure components of single-story industrial buildings made entirely out of reinforced concrete is three times greater than that of buildings with an all-metal frame. Buildings with a metal frame and lightweight roofing have the lowest cost: expenditures on their installation are minimal. The labor-intensiveness of installing buildings made entirely with prefabricated reinforced concrete is 30-40 percent higher than that for buildings with a metal frame.[1] Consequently, the use of lightweight panels and roofing slabs would permit a nearly two-fold reduction in construction time with the

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[1]PROMYSHLENNOYE STROITEL'STVO, No 12, 1979, p 5.

same number of workers and reducing unfinished construction to the norm. But this has been hampered by the extraordinarily broad application of prefabricated reinforced concrete, whose production has increased from 1.2 million cubic meters in 1950 to 120 million cubic meters in 1981, that is, 100-fold.

The trend towards developing the production of heavy parts continues. In spite of the low level of use (about 80 percent) of capacities to produce reinforced concrete items, the contractor ministries continue to build new plants. These capacities are increased by six million cubic meters each year. And inasmuch as the production of reinforced concrete has been at the same level -- 120 million cubic meters -- for three years, its use factor has fallen. We have not yet succeeded in building even one plant to produce phenolic alcohols or one to produce styrene, which would solve the problem of lightweight insulation: the above-mentioned ministries argue that the construction organizations are overloaded.

Many countries have recently carried out measures to reduce heat losses through building outer enclosure components. Increasing the thickness of panel and brick walls did not resolve the problem. Therefore, additional insulation is being applied, even on buildings previously built, using 5-cm thick polyurethane foam, along with layers of mineral fiber on attic and basement spans. As a result, heat losses have been reduced by 30-50 percent. Such measures are most effective in new construction. Insulating outer walls can be done either from the inside or the outside of the building. For example, an outer insulation of fiber glass protected by a layer of textured tinted glass was used in building "Sheremet'yevo-2" airport for the reinforced concrete walls, which are 3.5-fold thinner than single-layer claydite-concrete panels. The changeover to three-layer panels will thus ensure not only a reduction in building weight, but also a savings in fuel.

One feature of such panels is that each of its layers is installed separately. The thin reinforced concrete slabs are installed first; the fiberglass insulation panels and plaster-cardboard sheets are then secured to them so that their joints do not coincide and the sheets overlap one another. Using this method of putting up walls, after the building settles there are no continuous cracks, as in houses with single-layer panels, forcing post-settling repairs. In Moscow alone, over 4,000,000 meters of seams must be refinished each year after panel houses settle, requiring the expenditure of 500 tons of expensive Thiocol [a potassium guaiacol sulfonate resin].

An enormous overexpenditure of materials is permitted when laying brick walls. Their thickness is based on the thermal and sound insulation needed. In central regions of the country, brickwork is 64 cm thick and is done in 2.5 brick; in Yakutia -- 90 cm. The use of hollow-body brick would permit a 20-30 percent reduction in wall thickness. However, only nine percent of the total amount of brick produced is hollow-body.

Walls were made with lightweight components extensively during the prewar years (the Popov and Vlasov methods): two longitudinal walls the thickness of half a brick, with the space between them filled with a lightweight insulation. This brickwork was used in the 1970's to build the "Voronovo" stockraising complex in Moscow Oblast and three similar complexes in the Belorussian SSR, Leningrad

Oblast and the Bashkir ASSR. The space between the walls was filled with polystyrene. A decade of operation has recommended the indicated brickwork method well.

Brickwork is again being widely used abroad. This is connected not only with the fact that brick output per worker at automated plants has reached 2-3 million per year, but also with the use of lightweight brickwork.

Thus, in the USA, the thickness of outer brick walls is calculated not for thermal and sound insulating properties, but for building fire-resistance and varies from 10 to 30 cm. The thermal and sound insulating properties of the walls are ensured by the use of lightweight insulation and high-strength sheetrock, which is also the inside plastering. Lightweight brickwork is also used when putting up tall buildings (up to 44 stories), but in such a way that each floor rests on monolithic reinforced interstory copes. In the FRG, brickwork consists of two longitudinal walls half a brick thick, with the space between filled with poured foam concrete with a weight by volume of 400-600 kg/m^3. Foam is added to an ordinary sand-gravel-cement mixture instead of water, making the concrete 4-5 times lighter and reliably ensuring wall thermal and sound insulation.

Building weight also increases due to imperfections in the design of multistory buildings. Inasmuch as all the parts in such houses are standardized, their upper and lower floors are of identical strength, which inescapably leads to higher expenditures of materials and higher building weights.

There exist improved multistory housing designs. The frame is made of high-strength materials such as metal or monolithic reinforced concrete, and enclosure components and inside partitions are made of lightweight, lower-strength materials. As a result, building weight is reduced five-fold or more. But such structures have not yet been disseminated here.

The inside walls in panel housing are load-bearing; their thickness reaches 16 cm and their weight 2,200 - 2,400 kg/m^3. The spacing between the load-bearing walls is 3-4 meters, while experience indicates that this could be increased to nine meters, and some of the heavy inside load-bearing walls could be replaced by lightweight partitions consisting of two thin slabs (plaster-cardboard or plaster-fiberboard, for example, with a lightweight sound insulating material). Brick or plasterboard partitions in buildings with brickwork walls could also be replaced with such partitions. In addition to lessening their weight, the use of plaster-cardboard and plaster-fiberboard would permit a reduction in expenditures of materials and manpower, since it would no longer be necessary to finish the inside of stone walls with wet plaster.

This article has presented a far from complete list of measures to lighten buildings, measures whose implementation would provide an opportunity to solve many problems associated with speeding up construction, reducing unfinished construction and carrying out the plan for putting capacities into operation. These measures, although admittedly effective, are either entirely absent from the technical progress plans worked out in construction or are being implemented slowly.

Construction requires a large amount of lightweight openwork components. However, the production of progressive items is gathering strength slowly, since

their manufacture is disadvantageous for enterprises, which receive assignments in cubic meters and based on gross output, and which are therefore interested in producing heavy parts. It has also become advantageous to builders to use heavier and more expensive components and complete-set parts, inasmuch as the volume of construction-installation work includes the cost of materials produced by industry, and the more expensive metal and concrete is used, the higher the percentage of construction plan fulfillment and the higher the amount of profit. This indicates that indicators in construction are still imperfect.

The CPSU Central Committee and USSR Council of Ministers decree of 12 July 1979 anticipated the approval of indicators on putting production capacities and projects into operation, as well as overall and own-efforts commodity construction output volume (cost of construction-installation work in terms of enterprises, lines, start-up complexes, projects ready to produce output or render services, to clients) for construction-installation organizations, beginning with the 11th Five-Year Plan. The total commodity construction output volume is distributed by client. However, this work is only beginning to be done on a broad scale, and it is still too early for results.

The motor transport system, which is part of the construction conveyor, is not materially interested in hauling lightweight components, on the strength of the fact that its plans are approved in tons and ton-kilometers. Planning organizations are also interested in increasing estimated costs, inasmuch as the volume of planning work is set in percentages of the estimated cost of projects being built. Neither does the client display an interest in reducing the latter.

Thus, the more expensive raw and other materials enterprises and construction organizations use and the more heavy components motor-transport enterprises haul, the better nearly all their technical-economic indicators will be and the more material wealth the production collectives will receive. They therefore try to avoid mastering progressive components with lower materials-intensiveness and correspondingly lower prices.

Columns with a strength of 200 kg/cm^2 were used in building "Kosmos" hospital. This strength is quite adequate for a tall (22-story) building, since the weight of the outer wall panels in it did not exceed 20 kg/cm^2. However, heretofore, instead of lowering building weight, we have been increasing it, necessitating the use of higher-strength columns (up to 600 kg/cm^2). Given an average expenditure of reinforcing of about 400 kg/m^3 of reinforced concrete column, 800 kg of reinforcing and 590 kg of cement is being used in the higher-strength columns (which is more than double the average expenditure norm).

Along with increasing the weight of individual building elements, we are also permitting their shipment over greater distances. Long-range shipments in housing construction are widespread. Thus, with the Ukrainian SSR highly saturated with house-building combines, parts for building departmental housing for the USSR Ministry of Power Engineering and Electrification were delivered from Tol'yatti to Pripyat' in Kiev Oblast (1,722 km) and Arbuzinka settlement in Nikolayev Oblast (1,920 km). As a result, the cost per square meter of housing in these buildings increased by 24.6 rubles, or 17 percent, as compared with houses built using the output of local enterprises.

The country has quite a few construction and planning organizations which have succeeded in developing and implementing more effective planning resolutions and improved construction technology. Construction sites using them are generally completed faster.

Construction success depends largely on a precise technical policy. Unfortunately, the materials show that specialists often provide resolutions which are debatable from a number of very important positions. For example, it has been proposed for insulation production that we expand the release of cement fiberboard, which weighs 300-500 kg/m^3. Can we say that this material corresponds to the best domestic and foreign types of insulation if the mineral wool and fiberglass already in use have weights by volume of under 80 kg/m^3 and polymer insulation is 40 kg/m^3?

Another proposal, that more plants be built to produce arbolit, also requires more careful examination. Its main components are wood chips, cement and lime. It is lighter than claydite-concrete, but 10 times heavier than three-layer panels with lightweight insulation. These facts indicate that domestic and foreign experience is still being taken into account inadequately.

At the same time, insufficiently substantiated resolutions are often adopted. Thus, by the early 1960's the country had capacities to produce 13 million square meters of wooden house-building components. There was then a list towards building houses with prefabricated reinforced concrete and the production of wooden houses decreased two-fold over 17 years. In rural areas, this policy did not justify itself and measures had to be worked out to return wooden house building to the level of nearly 20 years earlier.

The production of steel construction components was sharply limited, with a view towards saving metal. In 1972, the USSR Gosstroy developed substantiation for the area of efficient application of steel and reinforced concrete components in industrial construction. In accordance with it, some of those restrictions were rescinded. It permitted the use of metal components in buildings with spans of 30 meters or more. In buildings with spans of 12, 18 and 24 meters, which comprise 87 percent of all single-story industrial buildings, their use was not recommended. Lightweight modular components were an exception. Nowhere else in the world are such restrictions in effect. We currently have more than 100 plants which manufacture steel construction components. Their production level exceeds six million tons, but plant capacities are not being fully used.

Characteristically, when determining the area of efficient application of steel and reinforced concrete components, consideration was not given to the expenditure of metal on forms for manufacturing reinforced concrete items or on metal fasteners for installing these items; the calculations assumed low-alloy steel reinforcing and brand "3" rolled steel for steel components. Obsolete steel components made of coupled angle sections were used for comparison. The most effective steel components, those made from curved section and from pipe, were not considered in the calculations.

In 1979, Academician N. P. Mel'nikov and a group of TsNIIpromstal'konstruktsiya Institute [not further identified] scientists, developed recommendations "On

Effective Areas of Application of Metal Components in Construction." The effectives areas of application of metal components proposed by them differ radically from their areas of use as set in TP-101-76, "Technical Regulations on the Economical Expenditure of Basic Construction Materials." It was recommended that metal components be more widely used, including in buildings with spans of 18 and 24 meters, that is, that their proportion of the total be increased from 13 to 81 percent, and that the area of application of reinforced concrete buildings be reduced from 87 percent (the current level) to nine percent. But in spite of the technical and economic substantiation of the above-mentioned proposals, designers have not begun using these progressive resolutions in plans.

The brick industry is experiencing difficulties. The development of brick production was "frozen" from 1955 through 1965. During the next 10 years, it increased by 30 percent, but it has again been decreasing since 1975. The branch has obsolete equipment. Average labor productivity at old enterprises is 20 to 30 times less than at new, automated brick plants.

Brick is distinguished from many modern construction materials by its good heat-, water- and sound-insulating properties, its strength and resistance to fire, the fact that it does not sag or crack. However, it is intensively being displaced from the area of application in outer walls of heated buildings and is being directed in large amounts into the construction of fences, enclosure components, unheated buildings (garages, warehouses, transformer substations, and so on) and buildings with excess heat (boiler rooms, forging-pressing shops, rolling mills). Brick is widely used for inside partitions in industrial and administrative reinforced concrete buildings, where its valuable heat- and water-insulating properties are not needed. At the same time, prefabricated reinforced concrete is being used increasingly widely to put up the outer walls of heated buildings. In terms of strength and fire-resistance, it meets the requirements for outside walls, but it possesses low heat-insulating properties and needs additional insulation.

Wall panels made of heavy reinforced concrete 100 mm thick, with fiberglass sheet insulation, were used in building "Sheremet'yevo-2" airport and the Krasnaya Presnya Trade Center. These panels weigh less than 250 kg/m^2. However, their use is extremely limited. Claydite-concrete wall panels 350 mm thick, weighing 600 kg/m^2, are widely used, however. Their manufacture requires 3.5 times as much cement, sand and claydite gravel. As a result of use of the latter instead of crushed sedimentary or igneous rock, lightweight concrete panels have 10 times less strength and are used not as free-standing, but only as suspended. They are hung on inside walls which, in this connection, have to be several times stronger which, in turn, requires increased expenditures of cement and metal.

During development of the Comprehensive Program of Scientific-Technical Progress for 1976-1990, the USSR Gosstroy proposed that the manufacture of components made with lightweight concrete using porous aggregates be increased four-fold. This was based on the fact that the economic effectiveness of using structural-insulating lightweight concrete is characterized by a reduction in adjusted expenditures on production, transport and installation expenditures per square meter of outside walls as compared with the use of three-layer reinforced concrete panels with mineral-wool insulation. Since 1980, using these same adjusted

expenditures, the NIIES and TsNIIEPZhilisha [Central Scientific Research and Planning Institute for Standard and Experimental Housing Planning] have proven the greater efficiency of the three-layer panels, which were previously considered ineffective.

Approximately 30 million cubic meters of stone and brick is used in housing construction (given an overall brickwork volume of 155 million cubic meters). In this connection, the question arises: is it necessary to increase the share of panel houses in housing construction and reduce brick expenditures in housing construction? We should apparently be directing not 30 million but 50-60 million cubic meters of brick into housing construction and reducing its expenditure in the construction of unheated buildings correspondingly. And we could manufacture with the panels now going into the construction of heated buildings three times as many panels for unheated buildings and those with excess heat, and without increasing manpower and materials expenditures.

For a long time, consideration was not given to expenditures on producing metal, cement, claydite and other materials arriving at house-building combines when comparing the various methods of construction production. The NIIES and TsNIIEPZhilishcha attached to the USSR Gosstroy have determined the so-called full national economic expenditures of labor on manufacturing materials and items and on building large-panel and brick houses. They are 30 hours per square meter of living space for large-panel houses. The average cost of one hour of labor is one ruble. Consequently, the cost per square meter of total living space must be limited to 30 rubles, while it actually equals 150 rubles.

Nonindustrial methods include construction using monolithic reinforced and ordinary concrete. After construction of "Kosmos" hospital and "Sheremet'yevo-2" airport in Moscow, the ore-concentration combine in Kostomuksha and hotels in Sochi and elsewhere was complete, with the effective use of monolithic reinforced concrete, the attitude towards it began to change. However, little has yet been done to expand the production of monolithic concrete and reinforced concrete. Only the Moldavian SSR does extensive housing construction using monolithic reinforced concrete.

The present level of building construction using monolithic reinforced concrete permits pouring the entire building. But what is prefabricated house building? This means a reinforced concrete house assembled from several hundred parts which must be handled manually at the construction site, fit and welded to one another in at least six places. The house is thus built twice, once at the factory and once at the construction site. But even given this, it is less strong. No matter how the joints of prefabricated reinforced concrete items are fastened, rigid connections are not obtained, since the very principle of reinforced concrete prefabrication predetermines an overexpenditure of materials.

The present level of technical progress in construction production permits implementation of a broad program to reduce materials and labor expenditures and lower the estimated cost of construction. But to do this, we must first of all increase the activeness of experimental design work, use the experience accumulated in world practice in using lightweight building and structure components, expand the production of lightweight insulation and other materials reducing the weight of buildings. No capital construction improvement program can be effective

so long as components are not lighter and the norms of materials expenditure and labor intensiveness in construction are not lower. This is a feasible way to reduce construction duration and bring unfinished construction down to the normative level.

In recent years, individual ministries have done much in the area of industrializing construction and lightening buildings. The Ministry of Construction of Petroleum and Gas Industry Enterprises plans extensively using unit-set construction for pump and compressor stations and other facilities. In this regard, construction time is reduced several-fold and the labor expenditures on and materials-intensiveness of the projects being built are lower. The Ministry of Installation and Special Construction Work has expanded its use of lightweight steel building components and their conveyor-unit prefabrication. Polyurethane production has been set up.

The impact of lightening buildings becomes perceptible when reinforced concrete slabs, monolithic reinforced concrete components, brickwork and artificial and natural masonry are insulated with lightweight materials. Unfortunately, due to the scarcity of raw material, the capacities which have been created to produce such insulation are operating at less than 50 percent of capacity. The replacement of heavy building roofs, brick and reinforced concrete wall components with lightweight insulation will enable us to reduce capacities producing cement and prefabricated reinforced concrete and to retool them to produce thin reinforced concrete, plaster-cardboard and plaster-fiberboard sheet.

We are currently erecting 150 million cubic meters of brickwork annually. That amount will be reduced by 30 percent with the changeover to producing hollow-body brick to replace solid-body and by 60 percent with the changeover to lightweight brickwork (single-brick) instead of solid brickwork (2.5-brick). Replacing single-layer claydite-concrete panels with three-layer ones using a lightweight insulation will enable us to reduce capital investment expenditures on construction-installation work.

The greatest impact from lowering building weight is achieved with the use of lightweight masonry, prefabricated and monolithic reinforced concrete, as well as new building prefabrication technology. This permits a significant reduction in construction time. It is known that reducing construction time by just one year produces a nationwide savings of about 10 billion rubles -- 50 billion over a five-year plan. Experience in the conveyor-unit prefabrication of buildings made with lightweight components at the KamAZ and Krasnoyarsk Heavy-Duty Excavators Plant demonstrates that use of this method reduces the time involved in putting up a project by two or three years.

In order to achieve a significant reduction in construction duration, it is not mandatory that all buildings in a project being built be erected using lightweight components. Thus, only 0.8 million of the 2.2 million square meters of production space at the VAZ [Volga Motor Vehicles Plant] used roofs made with shaped steel deck with lightweight insulation. These were the plant's most labor-intensive shops, the assembly shops. The remaining buildings, smaller in area, were built using ordinary prefabricated reinforced concrete technology, but it was not they which determined the overall duration of plant construction.

Concentrating capital investments at fewer construction sites must be anticipated as an integral element in lowering material and labor expenditures by lightening buildings and, on that basis, shortening construction schedules. But to do this, we need a new direction in technical progress in construction production, which must be based not only on increasing the factory finish of components and parts, but also on a significant reduction in component weight (both factory manufactured and also monolithic reinforced concrete and masonry), on the ever-increasing use of lightweight steel construction components.

11052
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NEW CEMENT ADMIXTURES INTRODUCED

Limestone Used As Admixture

Moscow STROITEL'NAYA GAZETA in Russian 21 Jan 83 p 3

[Article by I. Luginina, chief of a department and professor of the Belgorod Construction Materials Technological Institute, and V. Luzhnov, chief engineer of the Angarskiy Cement Mining Combine, in the column "Second Life to Secondary Resources": "Prohibition Removed, New Admixture to Cement May Now Be Used"]

> [Text] Nearly 20 million tons of limestone with increased content of magnesian impurities lie idle in the quarry dumps of the Angarskiy Cement Mining Combine, in the area of the city of Slyudyanka. These deposits have been increasing by 1-1.5 million tons annually. At the same time, the number of comparatively pure limestone deposits has been declining every year. A particular shortage of this raw material has been noticed precisely in regions of Siberia.

Scientists and production workers are faced with the task of developing a cement production technology which uses limestones extracted in the quarries to the maximum. The collective of the Angarskiy Cement Mining Combine and the cement technology department of the Belgorod Construction Materials Technological Institute imeni A. I. Grishmanov decided to solve this task.

Our teamwork began 10 years ago. The Angarskiy Cement Mining Combine is using limestone and ash contaminated by impurities as raw material. Fluorspar, which speeds up the process of clinker formation in the rotating kiln, is introduced into the raw material mixture. According to the manufacturing method existing at the combine, the agent was added to the mixture with all components simultaneously. Laboratory experiments have indicated that the activity of the clinker rises when the limestone is grinded together with the agent. Industrial tests have confirmed the correctness of conclusions made by research workers. The proposed method has improved the caking quality of clinker and reduced the formation of clinker dust. The combine has begun stable production of the "500" brand cement.

Currently our efforts are aimed at finding a more available substitute for the fluorspar. There are dumps of phosphogypsum near the city of Angarsk.

Preliminary observations have provided a fully reassuring result: the plant can use phosphogypsum as an additive instead of fluorspar. Recently lengthy industrial testing of this additive was conducted. All kilns of the combine operated on the slime with the new additive for one week.

The tests have shown that the formation of coating has improved, the clinker's quality indicators have not been reduced and its granulometric composition has not changed. The new admixture can already be used now, but the technological scheme of its accession will require minor reconstruction. However, its economic advantage is considerable: the delivery of phosphogypsum in dump trucks will be 100-fold cheaper for the combine than using fluorspar.

Being solved at the same time was a second, an exceptionally important task: the use of dolomitic limestone in cement production. Scientists imposed a ban on this raw material, which contains impurities of some metal oxides, as far back as the past century. Their use leads to a danger of an irregular change in the cement volume during hydration, a reduction of its strength.

At present, in view of this circumstance, the combine is not using all of the limestone extracted at the Pereval quarry in cement production, some of it is either sold or dumped.

Joint experiments conducted by scientists and combine workers in neutralizing the negative influence of metal oxides have indicated the possibility of obtaining cement having stable indicators from this raw material. Naturally, transporting it over long distances and using it in concrete for primary structures is premature. But it can be safely used in structures which are under constant control during their period of service.

Experiments at Leningrad Institute

Moscow STROITEL'NAYA GAZETA in Russian 1 Jan 83 p 2

[Text] Cement production is a power-intensive process. The Cement Industry Scientific Research Institute [Giprotsement] in Leningrad decided to put this axiom in doubt. How? By activating the raw material under radiation on an accelerator. This experiment was conducted at the Electrophysical Apparatus Scientific Research Institute imeni D. V. Yefremov. The result was sensational! The raw material was immediately transformed into cement clinker.

As a result, a new direction in science has appeared.

This was described by our newspaper on 1 January 1981. S. Danyushevskiy, senior scientific associate of the Giprotsement Institute, describes what events occurred during these 2 years and what will happen in the near future:

The general construction work on the experimental installation in Novosibirsk is nearing completion. Installation work should be completed in the second quarter and in the third quarter it is planned to start up the first installation with a productivity of 50 kg of cement per hour on an accelerator of 50 kW capacity.

The stuffing, units of the device, are partially already ready today but many of them were made instinctively. For example, we still have to think how to convey and extract raw material under industrial conditions. There are also other technological problems.

If the experiment progresses normally, in 1984 it is planned to increase the capacity of the experimental laboratory installation up to 200 kg per hour, and afterward to a ton.

The capacity of accelerators and their utilization ratio should increase correspondingly. Of course, all of this is very, very complex. But scientists do not insist that a giant accelerator work on an installation which, for example, has a 10-ton per hour capacity. Let there be several of them.

Scientific experiments have not stopped and are being continued at present. There are two extremely complex stages in the production itself. The first is that the beam of accelerated electrons must broach the entire portion of the raw material mixture uniformly so that every small grain of the meal receives the same volume of energy. How will this be achieved? We believe that one of the possible variants is a weighted, atomized condition of the raw material. At any rate, it is being indicated by some results of the experiments.

The second stage is that the cement on its exit from the installation will be heated to 1,100-1,200 degrees. This means that it must be allowed to cool in a manner that will prevent the waste of heat. We have several variants for selecting the heat, but the best of them will be proven through experience.

During 1982, we were able to establish one more important parameter. It was found that the clinker obtained in a beam of accelerated electrons is grinded easier than the one obtained by the traditional method in rotating kilns. The conclusion is important: possibility of saving more energy.

There is absolute clarity: the cement obtained in an accelerator does not have any residual radiation, it is absolutely safe, and so is the production itself. It is clear that production will be much cleaner and the people will work in white coats.

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BUILDING MATERIALS

SHORTAGE OF BUILDING MATERIALS IN SIBERIA DEPLORED

Moscow STROITEL'NAYA GAZETA in Russian 31 Dec 82 p 3

[Article by A. Rezchikov, chief of the Department for the Development and Distribution of Construction Production and the Construction Materials Industry of the RSFSR Gosplan's Central Scientific Research Institute of Economics [TsENII] and candidate of economic sciences, in the column: "Scientific ic and Technical Programs": "The 'Arctic' and Others"]

[Text] Diversified programs are a basis for the formation of large territorial-production complexes in Siberia. However, implementation of the currently existing and developing integrated programs such as the "Siberia," the "Arctic" and the "BAM Zone" require a systemic approach to the development of the material base of construction, in particular a unified policy in the distribution of enterprises of the construction materials and construction industries.

During a period of little more than 10 years, the volume of capital investments in the development of Siberia has increased sharply. Some 350 large plants and combines were constructed as well as many shops and production facilities at existing enterprises of various national economic sectors, elevators, barns for millions of head of livestock and many poultry farms, hothouses and other facilities. Residential houses, schools, preschool institutions, hospitals, motion picture theaters, clubs and other facilities were constructed on an ever-increasing scale.

Realization of such a vast program was made possible as a result of the development of the material and technical base of construction. Hundreds of large construction materials enterprises are in operation in Siberia. During the 1971-80 period alone, capacities for 3.3 million tons of cement, 160 million standard slate tiles and 250 million m^3 of soft roofing material were commissioned.In 1982, a special three-layer panels shop was put into operation in Norilsk at the plant of metal guard structures and mineral wool products. The Mal'tinskiy Construction Materials Combine (Irkutsk Oblast) began production of heat insulation slabs.

However, the achieved level of development in the construction materials industry still does not meet the requirements of the integrated programs both as regards quantity and quality of production. Although construction and installation work

increased by 67 percent during the 1971-80 period, the gross production of the construction materials industry increased by only 46 percent. The structure of wall and nonmetallic materials is also being changed slowly. Because of this large quantities of cement, crushed rock, precast reinforced concrete, bricks and heat insulation and other materials are delivered to construction sites in Siberia. A total of 1.3 million tons of cement, 2.2 million tons of reinforced concrete and 240,000 tons of wall materials are delivered from the Urals alone.

At the same time, despite the shortage of construction materials some ministries have been permitting reduction of their production. For example, in 1981 compared with 1975 the output of reinforced concrete was reduced in Omsk and Chita Oblasts, of wall materials in all oblasts with the exception of Tyumen Oblast and Krasnoyarsk Kray and of cement in Novosibirsk Oblast and Buryatia. Less nonmetallic materials are produced in Kemerovo Oblast by the Ministry of Transport Construction and the Ministry of Construction of Heavy Industry Enterprises of the USSR, in Irkutsk Oblast by the USSR Ministry of Industrial Construction and the Ministry of Railways, in Chita Oblast by the Ministry of Railways and in Novosibirsk Oblast by the RSFSR Ministry of the Construction Materials Industry.

Consequently, the use of production capacities has deteriorated. As regards precast reinforced concrete they are loaded less than 80 percent in Siberia and 76 percent at large-panel house construction plants [KPD]. They are being used especially unsatisfactorily at enterprises of the USSR Ministry of Construction, the RSFSR Ministry of Rural Construction and the Interkolkhoz Construction Association. The situation is the same as regards nonmetallic and wall materials and porous aggregates in Omsk, Chita, Irkutsk and Tomsk Oblasts, Altay Kray and the Buryat ASSR.

The main reasons of unsatisfactory utilization of capacities are the low technical level of many enterprises, the commissioning of new capacities with numerous flaws in workmanship, the shortage of skilled personnel and the irregularities in supply.

Capacities are being put into operation very slowly at the Tataurovskiy Construction Materials Combine, the Gornovskiy Specialized Reinforced Concrete Plant, the Cheremkhovskiy Cardboard and Ruberoid Roofing Material Plant and the Krasnoyarskiy Asbestos Cement Products Plant. Enterprises are also being constructed at a very slow rate. Construction is progressing especially unsatisfactorily of the Novoaltayskiy SSK [not further identified], the reinforced concrete pipe plant in Tulun City, the Tashebinskiy Gravel and Sand Quarry with a concentrating factory, the gravel sorting plant in Kharpa, the large-panel house construction combine in Surgut, the large-panel house construction plant in Tobolsk and the consolidated construction and construction materials industry enterprises in Nadym.

Construction materials and structures plants are distributed irregularly. They are basically located in southern regions of Siberia and concentrated in administrative centers. For example, more than 90 percent of cement, 56 percent of precast reinforced concrete and porous aggregates, half of all wall materials and 70 percent of crushed rock is produced in Irkutsk, Kemerovo

and Novosibirsk Oblasts and in the south of Krasnoyarsk Kray. Nearly 90 percent of all precast reinforced concrete capacities in Omsk Oblast are located in Omsk. The situation is not better in Chita and other oblasts.

The shortage of construction materials is also aggravated by departmental dissociation. More than 30 ministries and departments are in charge of construction and production of construction materials in Siberia. But only 18 percent of nonmetallic materials, 4 percent of porous aggregates and 70 percent of bricks and building blocks are the share of the specialized RSFSR Ministry of the Construction Materials Industry.

Even in territorial-production complexes a greater number of organizations and enterprises are engaged in construction and production of materials. For example, in the West Siberian Territorial-Production Complex there are 25 ministries and departments. A similar situation exists in the Kansko-Achinskiy and other territorial-production complexes.

During the current five-year plan, construction workers of Siberia must fulfill construction and installation work valued at more than R50 billion. The grandiose program of capital construction can be fulfilled only through further improvement and development of construction production and its material and technical base. By the end of the five-year plan, regions of Siberia will require 15.5 million tons of cement, 12.5 million m^3 of precast reinforced concrete, 8 billion standard bricks as wall material and 100 million m^3 of nonmetallic materials.

Increased production must be achieved, first of all, by considerably improving the use of existing capacities, stepping up construction of projects undertaken earlier, modernizing and retooling existing enterprises and replacing worn-out unproductive equipment. Construction of plants is now planned basically in areas of new construction.

There are still many unsolved problems today in the construction materials and construction industries of Siberia. In accordance with the requirements of integrated programs, the structure of the production turned out must be improved and its quality and completeness must be raised. It is necessary to introduce more persistently progressive manufacturing methods and equipment, which is able to function reliably and efficiently in specific natural-weather conditions. Ministries and departments have been devoting insufficient attention to the production of materials and structures that are completely ready for utilization and to ensuring reduction of weight, materials consumption, power consumption, labor consumption and the cost of manufacturing and constructing buildings and installations.

The question of establishing regional nondepartmental construction bases has not been solved to date. It is also necessary to expand surveying and geological prospecting work for the purpose of establishing a solid minteral and raw materials base.

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NEW CONSTRUCTION TECHNIQUES, MATERIALS DESCRIBED

Frunze SOVETSKAYA KIRGIZIYA in Russian 25 Jan 83 p 1

[Text] Even a 10-point earthquake is not frightening to the large-panel house with a seismic insulation belt, which is under construction in Frunze. A building of such design is being erected for the first time in the country.

The innovation here is in that the shell of the house and the foundation are not bonded hard together. During an underground tremor, the building moves from its place but then immediately returns to its initial position because the foundation has a concave spherical surface form. The necessary slip is ensured by fluoroplastic and metal plates: the first is fastened to the base of the shell, and the second to the foundation.

The new method makes it possible to raise the seismic stability of buildings without additional reinforcing of reinforced concrete structures and increasing the use of cement.

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PREPARATION OF BUILDING FOUNDATIONS IN FAR NORTH DESCRIBED

Moscow STROITEL'NAYA GAZETA in Russian 17 Dec 82 p 3

[Article by B. Fedorov, USSR state prize winner, RSFSR merited construction worker and candidate of technical sciences, and L. Petrosyan, candidate of technical sciences, in the column "High Growth Rate to Technical Progress": "Water Cuts the Soil"]

[Text] One of the most labor-consuming construction processes in regions of the Far North is preparing frozen and perennially frozen soil for bases and foundations of buildings and structures. The volume of such work at present has reached 30 percent of all excavation work.

The USSR Gosstroy's Scientific Research Institute of Foundations and Underground Structures has already developed and successfully tested a method of working frozen and perennially frozen soil with the aid of high-pressure hydraulic jets. Its essence consists in the following. A pumping installation feeds a working fluid (in most cases just ordinary water) into a special monitor under a pressure of 200-700 kilogram force per cm^2. A thin jet of water gushes through a nozzle at a speed of 800-900 km per hour and cuts through the frozen soil in seconds. Research has indicated that pumping installations developing a force of 300-500 kilogram force per cm^2 are quite sufficient for construction workers. It must be noted that despite the great pressure there is practically no thawing of the soil--there should be no concern about the strength of the foundations on permafrost.

The method was approbated under natural conditions in laying strip foundations. In sinking trenches and pits, the soil was cut by the water jet to blocks of assigned size and configuration. The size of the blocks is determined only by the carrying capacity of equipment, including bulldozers, excavators and clamshell cranes. Of special important significance is the circumstance that the new method makes it possible to perform work in the confined conditions of city and industrial development, including in winter. Moreover, the periods of construction and its cost and labor intensiveness will be one-third to one-fourth as much as before.

The new method may also be used in rapid opening of underground cable trunk lines during their reconstruction and, more importantly, during their breakdown.

The institute is currently conducting research in using high-pressure water jets in laying pile foundations on permafrost. A substantial effect should be achieved here also.

Because the soil does not thaw, it takes considerably less time for it to be fused with a pile into a solid mass. It is reduced to the time when the pulp, which fills the pockets between the pile and the walls of the hole, congeals. The use of high-pressure hydraulic jets in placing piles with a widened heel will make it possible to considerably improve the carrying capacity of pile foundations and reduce the depth of their placement.

Broad introduction of the method now depends on supplying construction workers with corresponding equipment, including mobile installations for work to be done in cities in the northern and central areas of the USSR.

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LIMESTONE DUST USED IN ASPHALT CONCRETE PRODUCTION

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 28 Dec 82 p 3

[Text] Ordinary limestone has become a substitute for cement dust--a basic component in the production of asphalt concrete. Laboratory research conducted by specialists of the Tajik Road Construction Trust [Tadzhikdorstroy] has indicated that the mineral dust made from limestone improves bonding of the bitumen with the rock material of granite variety. This gives special strength to the road pavement.

A base for the production of such dust is under construction near the limestone quarries of the Dushanbinskiy Cement Combine.

Trust manager N. Kadyrov said: "We had to stop using cement dust in asphalt concrete production, first of all, because there is not enough of this byproduct of the cement industry for road construction enterprises. Moreover, the use of mineral dust may accelerate and reduce the cost of asphalt concrete production and also improve the quality of road pavement."

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SEARCH FOR NEW BUILDING MATERIALS, SUBSTITUTES DISCUSSED

Kiev PRAVDA UKRAINY in Russian 23 Dec 82 p 3

[Article by editor A. Zonenko: "New Materials in the Service of the Five-Year Plan"]

[Text] Three basic directions determine the activity of the republic's scientists-materials specialists at the contemporary stage--a search for steel, cast iron and nonferrous metal substitutes as well as for effective and low-priced materials for the construction industry and the creation of materials which have high, special properties. A meeting of the Commission for Questions of Scientific and Technical Progress of the UkSSR Council of Ministers' Presidium has discussed further development of scientific research in this field and introduction of new economical building materials in the national economy.

In the report by Academician V. I. Trefilov, vice president of the UkSSR Academy of Sciences, and in other addresses it was noted that as a result of a complex of scientific research and experimental design work conducted by institutes of the UkSSR Academy of Sciences and metallurgical and machine-building enterprises and organizations, a new class of reinforced metal structural materials in the form of rolled stock as well as pipes and various castings was created. Three basic technological schemes of their production have already been implemented in the republic's industry. The greatest effect from this implementation is expected in the production of gas main pipes and various machine-building and automotive industry products. For example, up to 350 kg of metal is saved on every platform of an oversize-load dump truck that is made of reinforced laminated material.

As a result of a persistent search by the republic's materials specialists, new brands of steel and cast iron, glass and basalt plastics and glass concrete have appeared and industrial processes have been developed for obtaining powders and sintered materials as well as cheap and effective plastic fillers. It is planned to master production of 23 kinds of new materials at enterprises of the UkSSR Ministry of the Construction Materials Industry alone with participation of 45 scientific organizations of various departments.

At the same time, the commission meeting noted that some important individual work results are still being introduced slowly in corresponding sectors of the

national economy. In particular this concerns the use of metallurgical slag, ash and cinders of thermal electric power stations, shaft rock, byproducts of coal dressing and byproducts and associated products of chemical production.

The commission adopted a decision aimed at further developing scientific research in some promising directions and accelerating the use of obtained results in the national economy.

It also discussed the work in accelerating introduction of scientific and technical achievements, raising the technical level of production and reducing the input of manual labor at enterprises and organizations of the UkSSR's food industry. This was described in a report by minister N. F. Kulinich. Positive changes which have occurred in the ministry's activity were noted and further tasks were outlined as regards raising the technical level of the sector and organizing comprehensive control over the quality of production.

The meeting was addressed by S. I. Gurenko, deputy chairman of the UkSSR Council of Ministers. Responsible workers of the UkSSR Council of Ministers and UkSSR Gosplan and supervisors of ministers and departments of the republic participated in the work of the meeting.

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